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A Sino-Finnish initiative for experimental teaching practices using the Design Factory pedagogical platform

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The paper presents a Sino-Finnish teaching initiative, including the design and experiences of a series of pedagogical workshops implemented at the Aalto-Tongji Design Factory (DF), Shanghai, China, and the experimentation plans collected from the 54 attending professors and teachers. The workshops aimed to encourage trying out interdisciplinary hands-on teaching, and enable teachers to implement their ideas for teaching development utilising the DF pedagogical platform. The majority of the participants planned teaching experimentations aiming at enhancing student understanding of curricula through various group exercises utilising concrete artefacts, but found their implementation within established practices quite challenging, highlighting the challenges of transforming strategic collaboration into grass-root activity. However, the workshops ignited widespread interest in a continuum of collaboration in teaching development, and the DF has since acted as a hub for the implementation of subsequent internationalisation efforts of the two universities, including establishing a dual-degree programme.

Keywords: collaboration; internationalisation; multidisciplinary teaching; teaching practices; transfer

1. Introduction

The internationalisation of universities is of global importance, and university education is going through major reforms both in Finland as well as in China. Aalto University, created in 2010 in a merger of three leading Finnish universities, has been a forerunner in the European university reform, nurturing themes, research topics and ways of working crossing boundaries within the focus areas of the new university (Markkula and Lappalainen 2009). Accordingly, in 2010, Aalto University and Tongji University, Shanghai, signed a Cooperation Agreement and established the Aalto-Tongji Design Factory (ATDF, http://designfactory.aalto.fi/network/we-partner-with/) at Tongji University in line with the pedagogical concept of the Aalto DF (ADF) in Finland. The ADF in Finland, founded in 2008, occupies a 4000-square-metre facility on the university campus at Aalto acting as an experimental platform for developing interdisciplinary teaching and learning in Engineering education. The ADF facilities are used by students, teachers and researchers of engineering, economics, art and design, as well as entrepreneurs and industry representatives.

The 2010 strategic partnership of collaboration between Aalto and Tongji Universities has also given impetus for a dual-degree programme, the International Design and Business Management

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(IDBM) Master's level programme, which concretises the need for the teachers of both universities to be able to teach in a multicultural environment. At the core of the IDBM programme is the multidisciplinary learning and research that cuts across the areas of business, design and technology. During the two-year Master's studies, the Aalto and Tongji Universities' students spend one year studying in the collaborating university, mainly at the ADF and ATDF facilities.

However, as many seemingly important strategic alliances between Finnish and Asian universities have not proceeded beyond the signing of agreements, Finnish universities should strive to better understand their own needs and their ability to foster genuine mutually enriching internationalisation programmes (Ministry of Education, Finland 2007). In order to gain concrete advances of the strategic partnership between the Finnish and Chinese universities, and to contribute to the implementation of the dual-degree programmes for which the ADF and ATDF are the core facilities, a pedagogical workshop programme was implemented at the ATDF in Shanghai during April-May 2011. The programme consisted of pedagogical DF workshops at ATDF in April 2011 and a feedback session organised through a video connection window between the Aalto and Tongji DFs in May 2011. The aims of the workshop programme were to further strategic collaboration between the two universities at the grass-root level by:

(1) demonstrating the possibilities offered for the Chinese teaching faculty in utilising the novel 'learnscape' (Aspden and Thorpe 2009), ATDF, in their teaching, providing insights into integrating the DF facilities and ways of working into their own teaching approaches and breaking the tradition of lecture-based teaching
(2) opening up a mutual discussion on new avenues for advancing interdisciplinarity and multicultural awareness, as both Aalto and Tongji strive to help teachers develop courses for multicultural learning situations and to renew teaching concepts as eluded to also by Jinhui and Zhiping (2009).
(3) exchanging ideas and views on cultural and administrative differences and challenges in transferring teaching activities 'out of the classroom'.

Accordingly, the above aims also set certain limitations to the study. First, it is to be noted that Tongji University has a faculty of more than 8000. Therefore, the nature of the present study is more descriptive and does not attempt to cover in-depth analysis of specific activities enacted by the faculty as part of university governance at either university. Second, due to the descriptive approach of the present paper, and in accordance with the above aims, data on detailed cultural or institutional differences were not collected. Finally, it is to be highlighted that the present study does not aim to focus on measuring success or failure, rather the emphasis is on describing of new avenues for exploring mutual international activities.

1.1. *DF as a pedagogical platform*

The design of the workshop programme was based on the ways of working at ADF, which have evolved through the input of teachers and students, and, which, over time have become moulded into various informal approaches. A common label describing the various teaching manifestations could perhaps be experiential pedagogy, which strives to emphasise student-centricity, encourage passion-based learning and link theory to practice in project-based studies. Examples of the manifestation of this approach in Aalto university activities include for example the 'Murjottelu' interdisciplinary student team-based industry trainee programme (Itkonen, Ekman, and Kojo 2009) and teaching science through conceptualised learning (Nordström and Korpelainen 2011).

The experiential emphasis of the ADF pedagogical mentality stems from a situated cognition perspective, highlighting the relatedness of learning and knowledge to the learning situation and the social and cultural context of the knowledge. Knowledge and meanings are perceived to be

shaped by experience and culture, and are continuously reformed in social interaction (Kolb 1984; Usher, Bryant, and Johnston 1997). The content of the teaching should be presented in its actual context of appliance through actual participation, concrete doing, active thinking and problem-solving (Brown, Collins, and Duguid 1989). Accordingly, the 2011 ATDF workshop programme aimed at providing the participants with multiple opportunities of experiencing different ways of working first hand as well as applying their learning to the planning of their own teaching. The situated cognition approach was coupled with an apprentice-based teaching model, where learning occurs through observing action and guided participation in the action (Lave and Wenger 1991). The role of the workshop facilitators was to provide a model of skilled behaviour, as well as scaffold and encourage reflection for the participants. The aim was to gradually transfer the responsibility of the pedagogical development actions to the participants themselves (Brown, Collins, and Duguid 1989).

The experiential approach is further supported by trying out new approaches in practice through small-scale experiments, and providing the students with an opportunity to do so as well. Experimentation through for example prototyping provides a tool that can be used to explore ideas and stimulate thinking as well as to reflect on and evaluate generated ideas (Brown 2008; Koria, Graff, and Karjalainen 2011). Even though experimentation is often open-ended and uncertain (Lawson 2005), it has the potential to overcome cultural, linguistic, disciplinary and other such possible barriers between collaborators (Leonard-Barton 1995), lowering the threshold for participation by providing a common language between different parties, reducing risks and providing enjoyment (Björklund et al. 2011). It is thus well suited for a multicultural learning environment, where the pedagogy of experiential learning must be adapted to the different sociocultural contexts as well as discursive and material practices.

The present paper describes the experiences gained through the DF workshops and the follow-up activities as well as the later collaboration efforts, presenting the results of the experiential methods that were utilised and discussing the key challenges revealed by this collaborative initiative.

1.2. *Background and setting*

In the spring of 2011 ATDF at Tongji was still at an early stage of implementation, and as there was no official structure, content or user base, the two universities decided not to implement a complete, content-centred training programme, as the aim was to encourage ATDF users (Tongji faculty, staff and students) to take future responsibility for the role and content of the ATDF. Rather than provide only a space without a clear purpose or new methods without an implementation venue, the two universities considered it to be more fruitful to provide Tongji faculty and staff with a platform, practical tools and pedagogical support in form of the DF workshops for starting the process of establishing content for the ATDF.

In line with the experiential pedagogical approach typical of DF, the atmosphere of the workshops was kept as informal as possible: neither titles nor surnames were used, and the working materials were playful hobby crafts materials, such as Legos, paper dolls and commercial postcards. The exercises conducted at the introductory part of the workshop aimed at demonstrating the importance of small-scale experimentation in an early stage of the process, revealing and questioning the academic tradition of first carefully planning the action and then executing the plan. After the introductory part, the participants were encouraged to apply the experiential mentality into their own teaching, keeping in mind that they should feel free to create the kind of content and approaches that they felt would best address the needs of the Tongji University teaching and learning culture.

The facilitating team consisted of seven ADF employees, including five researchers and developers from various academic disciplines, one administrative coordinator and a professor who

was also a member of the board of the ADF. This team, together with the Chinese university representatives and staff members of ATDF, prepared the workshops. The preparations for the workshops included the design of the workshop programme and advertising the workshop to Tongji University faculty and staff. Tongji selected the individuals to the workshop in view of obtaining a very multidisciplinary group of participants.

2. Implementation of the DF workshops

2.1. *Participants*

The participants represented 19 different schools, colleges and departments (Table 1). Overall, the majority, 19 individuals, were from engineering disciplines, 12 were from management and economics, 7 from art and design, and 6 from linguistics with single representatives from the other disciplines. Of the 54 participants, 21 were male and 33 female. The class sizes of these teachers ranged from 20 to 150 students with the majority teaching classes between 40 and 60 students. These teachers estimated that of their total working hours approximately 47% is spent on teaching, 33% on research and 20% on other duties. The main methods of teaching used by these teachers in their regular teaching was by lecturing, 50-80% of the total teaching hours and by group work which constituted some 20-50% of teaching time.

2.2. *The pedagogical workshops (phase 1)*

Four identical workshops were organised on four consecutive days in mid-April 2011 at the ATDF premises in China. Each workshop lasted approximately five hours, and had 12–14 participating teachers. The workshops consisted of two phases: an introductory part and a hands-on exercise

Table 1. Workshop participants[a].

Position and title	Degree	Male	Female	Total
Professors	PhD or Dr degree	1	0	1
	Master's degree	0	0	0
	Bachelor degree	0	1	1
	All degrees	1	1	2
Associate professors	PhD or Dr degree	7	7	14
	Master's degree	0	1	1
	Bachelor degree	2	0	2
	All degrees	9	8	17
Lecturers	PhD or Dr degree	9	15	24
	Master's degree	2	6	8
	Bachelor degree	0	2	2
	All degrees	11	23	34
Associate researcher	PhD or Dr degree	0	1	1
Total number of attendees		21	33	54
Average age (years)		41.2	39.3	
% age between 30 and 40 years		66.7	69.7	
Age span (years)		29–56	28–56	

[a]The participants represented 19 different schools, colleges and departments of the Chinese University, namely School of Electronics and Information (5), College of Mechanical Engineering (3), School of Transportation Engineering (4), College of Civil Engineering, School of Economics and Management (11), College of Automotive Engineering (1), School of Medicine (3), School of Foreign Languages (6), School of Software Engineering (1), College of Material Science and Engineering (1), School of Aerospace Engineering and Applied Mechanics (2), Chinesisch-Deutsche Hochschulkolleg (1), The Sino-German University of Applied Sciences (3), the Zheijiang College, Economics and Management Department (1), School of Liberal Arts (1), School of Political Science and International Relations (1), International School of the University (1), School of Design and Innovation (6), Sport Department (1).

of planning a small-scale teaching experiment, trying out a new way to implement a part of their course, lecture or exercise.

At the beginning of each session the approach to the mutual activities of the workshop was outlined as follows: forget criticism, discuss and ask questions, give your best and have fun! To promote an informal atmosphere and to introduce some typical group formation methods and warm-up exercises used at ADF, the facilitators and participants further introduced themselves to each other by selecting a postcard that represented the kind of teacher they wanted to be. During the postcard session the participants described their own ideal role as a teacher as, e.g. caring, responsible, concerned, reliable, coaching, supporting, happy and environmentally aware. Following the introduction, a 45-minute presentation highlighted a recently documented teaching development case at ADF (Nordström and Korpelainen 2011). A lively discussion ensued on how teaching can find new avenues via the use of a pedagogical platform such as DF, what may be the challenges, how the teacher roles will need to change and how much time and resources may be needed to carry through new teaching approaches.

As it was evident that most of the participants had never met each other previously, it was important to also promote group formation during the workshop. Each group was composed of representatives of engineering, art and economics. To lessen the possible tension between the individuals as well as to highlight the importance of experimentation, the teams were engaged in another playful 'warm-up' activity, the Marshmallow Challenge (www.marshmallowchallenge.com). The participants were divided into groups of three to four based on the colour of their randomly assigned nametags. The task was to build the tallest freestanding structure, using the provided amount of spaghetti, string and tape, with an entire marshmallow on the top, in 18 minutes. The winning team would be the one with the tallest structure measured from the surface of the table to the top of the marshmallow. The overall atmosphere was excited and dynamic. At the end of 18 minutes, the structures that remained standing were measured, and each group was applauded. Thus the marshmallow challenge not only aided in the team formation process but it also provided the participants one possible tool that can be used with students to enhance group formation and teamwork skills.

The main task of the day was for the groups and the individual participants to plan a small-scale teaching experiment to try out a new method or approach in their own teaching. To begin with, two sets of cards were provided with keywords describing the experiential ADF teaching mentality: One set of cards had words related to the aim of a teaching activity (collaborative, interdisciplinary, problem-based, hands-on, student-oriented, multi-method, experimental or linking theory to practice) and the other set described the activity (informal, curiosity-promoting, fun, energetic, practical, creative, activating, motivating). Each team picked one card from each set, after which the teams were instructed to plan a teaching method utilising the two keywords in order to devise a teaching approach that the whole team could use in their own teaching. The teams had one hour to create both a written description (including the aim, basic idea, target, timing, required resources and feedback) and a prototype or demonstration of the method. Teams were provided with Legos, modelling clay, paper dolls and hobby materials such as paper, pens, scissors, glue, etc. One facilitator was designated to each group to ensure that all members engaged in the process and understood the task. Each team was required to make notes as they proceeded, often with the help of the facilitator.

Following some 50 minutes of the team session, each team proceeded to demonstrate their methods for the entire group in a 10-minute presentation. The notes made by each team were photocopied and distributed to all participants. A few minutes were reserved after each presentation to comment and ask questions on the created method. All the methods presented included some experiential and prototyping elements but were focused on very discipline-specific content and the combination of, e.g. art, engineering and economics was not quite evident. After all of the teams had presented their teaching methods, all participants were further asked to create their own

Table 2. Examples of the teaching experimentation plans produced.

Basic idea	Goal
Game + workshop: the target of teaching is to get to know about cultural differences in language application (1) Kite flying: students are expected to put down a good idea on paper in Chinese, just like marking their own kites (2) Sharing ideas: students try to put across in English according to the Chinese on the sheet (3) Identifying their own kites: look at all the translations and decide which one has done for his kite (4) Conclusion: the same idea could be expressed in diverse ways as there are cultural differences among people	For the teacher: easy to impress those differences upon the students For the students: easy to understand the differences and to be aware of them in language practice
(1) Players are split into eight groups (2) For the same optimising problem, each group will carry out the resolving procedure, including optimising mathematical modal establishments and effective algorithm design (3) Comparing the advantages and disadvantages of different solutions obtained by different groups (4) Selecting the most suitable solution for this problem	Obtaining the optimising solution satisfying the subject function is the goal, and my students will establish different mathematical thinking method for the same problem
The method described here is to be applied to Technology English in Civil Engineering that I teach this semester (1) Prepare pieces of cards, each of which carries an English word that I frequently used to describe the characteristics of soils in the field of geotechnical engineering (2) Ask every student to pick one card, explain the definition and describe relevant behaviour in English in three minutes	To encourage students to speak out in English in class. They should not be only a memorising machine for English vocabulary related to their field

individual experimentation plans in 10 minutes using elements from the group presentations as a basis if they wished. The aim was to design a teaching approach that participants could actually use in their own current teaching. Participants documented in brief the aim of their experimentation, the basic idea, the target group of students, timing, required resources and feedback plan for the experiment. However, as some participants had already left for the day only 47 individual teaching experimentation plans were obtained.

The three most common goals among the 47 plans for trying out new methods and approaches (Table 2) were to provide more in-depth and complete understanding of the topic for students (47%), support the acquisition of team and communication-related skills (26%), and spark and maintain student interest and motivation (23%). The vast majority of the plans utilised group work or at least group discussions (a total of 89%). In addition, concrete artefacts or prototypes had a significant role in the experimentations – 22 cases used them as teaching aids and 13 created them in the planned teaching session. A further five plans were based on case problems, although they did not utilise concrete artefacts, and 10 plans included plays or presentations. The plans were technically simple, requiring only hobby materials or Legos (62%) or relatively simple tools, such as specific software and machinery (15%), or spatial arrangements, such as labs or tables that can be moved around (11%). Even the most complex requirements were outside experts and some expenses from tickets or travelling. Most of the plans were applicable to students from all levels (60%).

2.3. *Feedback and follow-up workshop (phase 2)*

After the workshops at ATDF, a feedback questionnaire and a request to take part in a follow-up workshop were sent to all the participants in May 2011. The participants were asked what

was the best thing about the April session, what had remained unclear, what their improvement suggestions would be for the workshop from the point of view of the Tongji University teachers, how their planned teaching experiments had worked out, what they had tried out or were planning to try out and what had or had not worked in the plans. The fast-paced schedule was prompted by several reasons: The feedback questionnaire served also as a reminder to try out the created plans. In addition, 10 of the participants were also going to attend another collaboration programme between the two universities organised in Finland in May 2011.

However, feedback on the workshops was obtained from only 13 participants of the total 54 workshop participants, likely at least partly due to being conducted in English rather than Chinese. The low response rate poses certain limitations to the interpretation of the responses. Six out of the 13 respondents felt that the best thing about the workshop sessions was the idea of learning through experiencing. The activities of the workshops were described as vivid, creative, situational and interactive, and two respondents highlighted the value of the communal atmosphere and the chance to meet and have an open dialogue with various teachers from different disciplines. The respondents were also interested in becoming familiar with more unconventional ways of organising teaching and learning activities: 'The best thing for me is to have a chance to observe how a lecture can be given in a different way.' However, even with such positive feedback, it was evident that the workshops left all 13 respondents somewhat apprehensive about the practical implication of the teaching plans in their own teaching as well as the continuation of the development efforts in their own departments: Concerns were voiced regarding the insertion of suitable methods in different classes of different domains or disciplines (two respondents felt that while new and different, the methods introduced in the workshops would not work for all students and study fields), difficulties of implementing the method when teaching mass courses, practical problems including resources, room arrangement, time and evaluating the teaching experiment. Improvement suggestions for the workshops included more specific topics and more targeted student groups, as well as more in-depth and concrete examples of the teaching process at ADF and Aalto University as a whole. One respondent suggested increasing the length of the workshop and two respondents requested organising more similar workshops and thus providing a wider forum of Tongji and Aalto teachers with the opportunity of getting together to exchange ideas and develop teaching methods further in light of the ideas gained from the workshops.

Unfortunately, the number of respondents reporting back on the possible implementation of their created teaching plans during the rest of the semester was also low, as only eight respondents reported on the status of their plans (Table 3). This was quite likely due to the fact that the implementation of teaching plans in the middle of the semester was most probably difficult. Three respondents described the implementation of their teaching plans in detail. In addition, one respondent described taking part in further pedagogical development activities: 'I'm studying more new teaching ideas and methods in different ways, including taking part in the pedagogical development workshop.' Another respondent reported trying to 'apply the teaching plan in the course, and making some changes to the course content'. Three respondents stated that they were planning to implement their plans later in the semester or sometime in the future. These teaching plans as well as the ones that had been implemented included mostly group work and group discussion. The respondents also mentioned increasing interaction, study visits, demonstrations and encouraging students to carry out presentations less formally and more confidently. The participants also reported positively on the outcomes of trying out their plans. For example, one respondent described the outcome of utilising group work as impressive: 'I was impressed for the method of team work to promote the students' understanding. The students in my class understood well and easily which I found out from their homework.' On the other hand, at this time, none of the participants had used the ATDF space for implementation of new avenues to teaching, nor did they mention this in their plans. Accordingly, there is a need for further encouragement for the use and development of ATDF by Tongji teaching staff.

Table 3. Example excerpts of the planned and executed teaching experimentations.

Basic idea	Outcome
The plan to carry out is as follows: (1) Students to do preparations including: the definition of public diplomacy by various ways; to collect information about Jewish Refugees Museum; to connect preserving the Museum with public diplomacy (2) Students to visit the Museum (3) Discussion about: (a) public diplomacy in contemporary diplomacy of China; (b) the significance of preserving historic sites based on the understanding of preserving the Museum; (c) the understanding of public diplomacy by various ways; (d) the more comprehensive understanding of public diplomacy based on the experiences in this visit (4) Each student to submit a report	No execution yet
According to the major direction, 63 students were separated into 4 groups: construction building materials group, metal materials group, inorganic materials group and macromolecule materials group. Different groups had different tasks. We hope to train students to learn team work. For example, in building materials group, I show the cement plant work and experiments work using PPT and videos. After that let students discuss together. I have tried to let students to read many books and journal references after class, then prepare a report separately, but share together	Executed
Actually I have been trying various teaching methods in my classes based on different texts. Recently I have been teaching a short story written by British writer Somerset Maugham and I used group discussion to ask students in groups to write a book review on the story before I taught them anything	It turned out well. Students had to work together, contributing their ideas to the group work to make their report the best one in the class and, in doing so, students' speaking time was greatly increased, which was my object for that lesson

At the end of May, only 8 of the 54 April workshop participants attended the follow-up workshop aiming to share the teaching development experiences with all of the workshop participants, gain feedback on their implemented plans, and meet and discuss with other colleagues interested in developing teaching as well as experience further teaching methods typically utilised at ADF. The follow-up workshop began with the participants sharing their development experiences and considering the enabling and hindering factors of experimenting with teaching, utilising the post-card presentation method (introduced in the April workshops) as well as a Learning Café method (https://wiki.hamk.fi/display/EOPE/Learning+Café). The latter method was chosen as it has a tendency to make group work more efficient, allowing the participants to work on a given subject individually and in small groups, as well as communally building on the work of other groups by developing their ideas further. After sharing experiences at ATDF, in China, the participants and the original ADF facilitators used a video connection window between ADF and ATDF (due to economic constraints of travel) to reflect together on central issues of the teaching experimentation plans, teaching in multicultural and multidisciplinary environments and shared also their concerns related to resources and curriculum design. The participants of the April workshops stated that they had received positive feedback from their students due to trying out their plans, and felt that similar pedagogical programmes would be beneficial also in order to be able to learn from their own colleagues who they may not normally work with and to share their experiences and gain more practical support to continue developing their own teaching within their own teaching culture.

2.4. *Next steps (phase 3)*

As the workshop participants gave positive feedback especially on the practice-oriented, problem-based and participant-centred approach to pedagogical development, the need for further

exploiting this approach in both universities became evident. Concurrent with the activities described in the present paper, also other collaborative and pedagogical activities were current between Aalto and Tongji during Spring 2011, which altogether resulted in proposals for strengthening the mutual collaboration on teaching development. Moreover, as the use of the ATDF learning space clearly attracted significant interest from the workshop participants, a need also arose to clarify the type of teaching development that would be most mutually beneficial for both universities.

3. Discussion

The pedagogical DF workshops between Tongji University, China, and Aalto University, Finland, highlighted similar challenges that both the Chinese and Finnish teaching staff face when developing their teaching approach outside the traditional classroom setting. It is evident that globally university teachers still continue to struggle with an inflexible curriculum, large class sizes and lack of adequate resources (Moore, Fowler, and Watson 2007). While there exists an agreement on the necessity of developing university teaching to better match the needs of multicultural and multidisciplinary learning in both universities, many issues still need further attention (Daniel 2008; Yang and Yao 2007)

Although the principles of experimental, experiential pedagogy seemed to translate across different cultural settings in theory, and the participants of the DF workshops were able to design context- and subject-specific teaching development experimentations for their own teaching accordingly, implementing the new ideas and practices may be a challenging step to take. While feedback on the workshop and the progress of the experimentations was limited (only 13 out of 54 participants answered the survey, and 8 took part in the follow-up workshop), several questions clearly remain on the practical application of the pedagogical approach to courses with different forms and topics. Moreover, only a few teachers seemed to have had the opportunity of implementing changes in their teaching during the one and a half months between the April workshop and the end of May follow-up session. Evidently, implementing the changes during an ongoing semester and without further practical support was perceived as challenging. Accordingly, for the long-term success of implementing such teaching development experiments, establishing a culture and organisational arrangements supportive of pedagogical development is critical (Yang 2008; Clavert and Nevgi 2011) and the users of ATDF must be provided with tools to take over the implementation of such activities.

On the other hand, the experiences gained in the pedagogical workshops ignited widespread interest in further and larger-scale collaboration in pedagogical development efforts. Plans for future pedagogical activities have focused on possible programmes, workshops or teaching faculty exchange. As an initial step towards more official collaboration, a Memorandum of Understanding has been signed between the two universities in November 2011. Moreover, the first Aalto University IDBM double-degree students started their studies at Tongji University in the spring of 2012, and Aalto and Tongji Universities have recently started a three-year pedagogical cooperation programme, which utilises the ATDF.

In conclusion, the workshops demonstrated possibilities offered by the ADF mentality for developing teaching, and familiarised the participants with the ATDF platform. Moreover, these workshops also provided insights into integrating the DF facilities and ways of working into such teaching approaches. Regardless of the rather limited feedback, it was also evident that the inspiration to continue mutual activities along the axis of the ADF-ATDF pedagogical platform was established and further pedagogical cooperation utilising the ATDF has since commenced. Thus, the 2011 workshops contributed towards opening up new avenues for advancing interdisciplinarity and multicultural awareness in teaching development. Finally, as both Aalto and Tongji strive to

help teachers develop courses for multicultural learning situations and to renew teaching concepts, it is evident that the ATDF provides a forum for exchanging ideas and views on cultural and administrative differences and challenges in transferring teaching activities 'out of the classroom', although the implementation of these thoughts still merits further development and long-term pedagogical training is warranted in both universities. Accordingly, the DF workshops provided a concrete, grass-root level example of a first-step method and of the challenges that pedagogical development actions face when transforming international strategic alliances between universities into actual development collaboration.

References

Aspden, E., and L. P. Thorpe. 2009. "'Where Do You Learn?' Tweeting to Inform Learning Space Development." *EDUCAUSE Quarterly* 32 (1). Accessed June 16, 2012. http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/WhereDoYouLearnTweetingtoInfor/163852

Björklund, T., S. Luukkonen, M. Clavert, S. Kirjavainen, and M. Laakso. 2011. "The Role of Experimentation in Creating and Sustaining Motivation in Design Work." In *Diversity and Unity*, edited by N. Roozenburg, L. Chen, and P. Stappers. Proceedings of IASDR2011, the 4th World Conference on Design Research, October 31–November 4, Delft, the Netherlands.

Brown, T. 2008. "Design thinking." *Harvard Business Review*, June, 84–92.

Brown, J. S., A. Collins, and P. Duguid. 1989. "Situated Cognition and the Culture of Learning." *Educational Researcher* 18 (1): 32–41.

Clavert, M., and A. Nevgi. 2011. "Yliopistopedagogisen Koulutuksen Merkitys Yliopisto-Opettajana Kehittymisen Kokemuksessa." *Peda-Forum* 11 (2): 6–16.

Daniel, C. 2008. *The Educational Attributes of Some of the World's 'Top 50' Universities* – A discussion paper, University of Western Australia.

Itkonen, M., K. E. Ekman, and I. Kojo. 2009. "Murjottelu – Interdisciplinary Training Campaign for Industrial Design and Engineering Students." *European Journal of Engineering Education* 34 (3): 263–271.

Jinhui, L., and L. Zhiping. 2009. "New Exploration in the Development Strategy for 'Going Out' for Chinese Foreign Cooperation in Higher Education." *Chinese Education and Society* 42 (4): 78–87.

Kolb, D. A. 1984. *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.

Koria, M., D. Graff, and T.-M. Karjalainen. 2011. "Learning Design Thinking: International Design Business Management at Aalto University." *Review on Design, Innovation and Strategic Management* 2 (1): 1–21.

Lave, J., and E. Wenger. 1991. *Situated Learning: Legitimate Peripheral Participation*. Cambridge: University of Cambridge Press.

Lawson, B. 2005. *How Designers Think – The Design Process Demystified*. 4th ed. Oxford: Architectural Press.

Leonard-Barton, D. 1995. *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*. Boston, MA: Harvard Business School Press.

Markkula, M., and P. Lappalainen. 2009. "New Openings in University-Industry Cooperation: Aalto University as the Forerunner of European University Reform." *European Journal of Engineering Education* 34 (3): 251–262.

Ministry of Education, Finland. 2007. *Suuntana Aasia. Tavoitteelliseen opetus-, tiede- ja kulttuuriyhteistyöhön Aasian maiden kanssa*. Opetusministeriöntyöryhmämuistioita ja selvityksiä 2007:31.

Moore, A., S. B. Fowler, and E. Watson. 2007. "Active Learning and Technology. Designing Change for Faculty, Students and Institutions." *EDUCAUSE Review* 42 (5): 42–61.

Nordström, K., and P. Korpelainen. 2011. "Creativity and Inspiration for Problem Solving in Engineering Education." *Teaching in Higher Education* 16 (4): 439–450.

Usher, R., I. Bryant, and R. Johnston. 1997. *Adult Education and the Postmodern Challenge: Learning Beyond the Limits*. London: Routledge.

Yang, R. 2008. "Transnational Higher Education in China: Contexts, Characteristics and Concerns." *Australian Journal of Education* 52 (3): 272–286.

Yang, R., and W. H. Yao. 2007. "Whose Knowledge Counts? A Case Study of a Joint MBA Program Between Australia and China." In *The World Yearbook of Education 2007: Educating the Global Workforce: Knowledge, Knowledge Work and Knowledge Workers*, edited by L. Farrell and T. Fenwick, 41–53. London: Kogan Page.

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